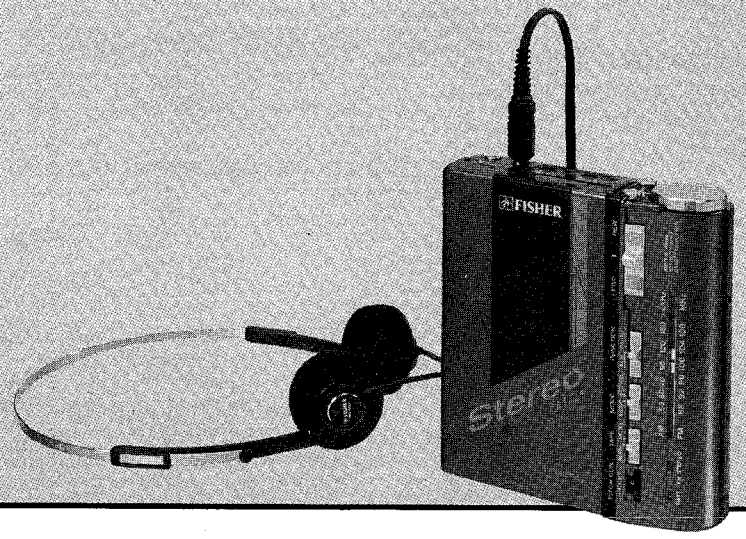
SERVICE MANUAL

FISHER

PH 33

Mini Stereo Radio Cassette Recorder

(EUROPE)



SPECIFICATIONS

Power Source	
DC	3V
(HP 7, Mignonzellen, R 6) x 2	
Output Power	18mW x 2 (max.)
Current Consumption (at Vol. min.)	
Playback mode	140mA
Fast Forward mode	190mA
Rewind mode	200mA
Tape Speed	1-7/8ips. ± 3%
Pitch Control −6:	−6%
Pitch Control +6:	+6%
Wow & Flutter	0.5% (WRMS)
Fast Forward Time	160sec. (with C-60)
Rewind Time	160sec. (with C-60)

Frequency Response	
Fe_2O_3:	63Hz~ 10kHz
Metal:	63Hz~ 10kHz
Signal to Noise Ratio	
Fe_2O_3:	45dB
Metal:	45dB
Crosstalk (with Fe_2O_3)	
Track to Track	55dB
Channel Separation (with Fe_2O_3)	30dB
Terminal Impedance	
Headphone	32Ω
Frequency Range	
AM	525~ 1,605kHz
FM	87.5~ 108MHz

–Specifications subject to change without notice.–

DISASSEMBLY INSTRUCTIONS

GENERAL REMARKS

1. Before disassembling the unit, spread a soft rubber mat or a cloth on the workbench to avoid scratches and grease stains.

2. Do not spread anything which is likely to cause static electricity because transistors and ICs are easily broken by it.

3. Reassemble the unit, noting the kinds of screws and the soldering and arrangement of the leads. Refer to "Circuit Diagram and Exploded Views" for correct assembly.

Soft-touch Mechanism

This Model adopts the soft-touch mechanism (Mechanical Logic System) which makes use of the motor rotation. This mechanism causes the following symptoms because of the use of the motor rotation and the symptoms shall not be considered defective.

1. When the PLAY button is pressed with the batteries almost used up, the Head advances forward and stops on the way. It does not return to its original position even if the STOP button is pressed.

   REMEDY:
   Replace all batteries with new ones and then, press the STOP button.

2. When the Function Switch is changed over to **AM** or **FM** position during the playback operation, the Radio will be heard but the Motor stops and the Head remains protrudent.

   REMEDY:
   Press the STOP button to set the unit in the stop mode.

NOTE:

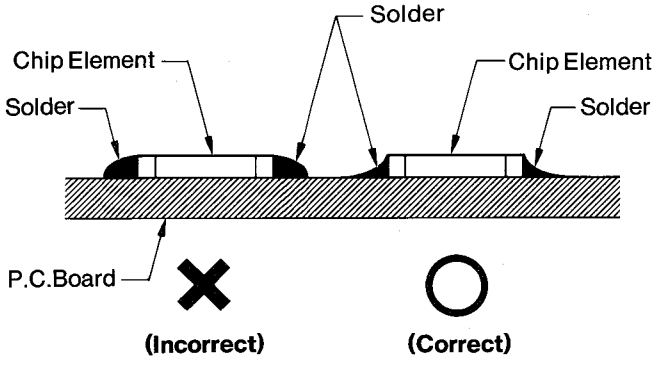
When the above symptom is observed, the Cassette Compartment Lid cannot be opened. Be sure to open the Lid after taking the correct remedy procedure.

NOTES ON HANDLING THE CHIP ELEMENT

Pay due caution to the following items:

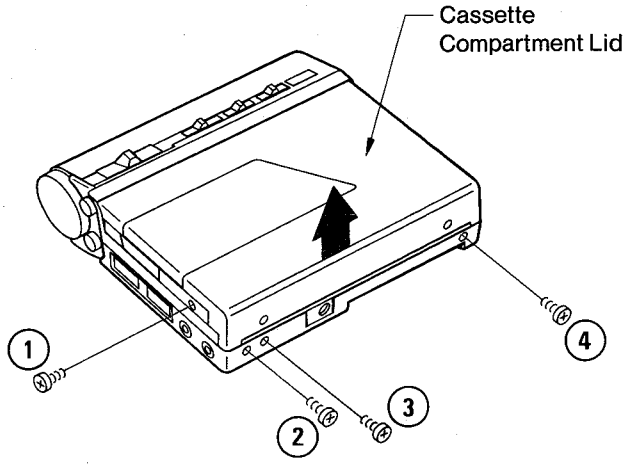
1. Do not use the removed chip element again.

2. Use a soldering iron of less than 30W.
   * The soldering iron should not touch the body of the chip element.
   * Complete soldering in a short time.
   * Apply solder to the chip element as illustrated below.



CASSETTE COMPARTMENT LID REMOVAL

1. Remove the four screws (1 ~ 4) fastening the cassette compartment lid.



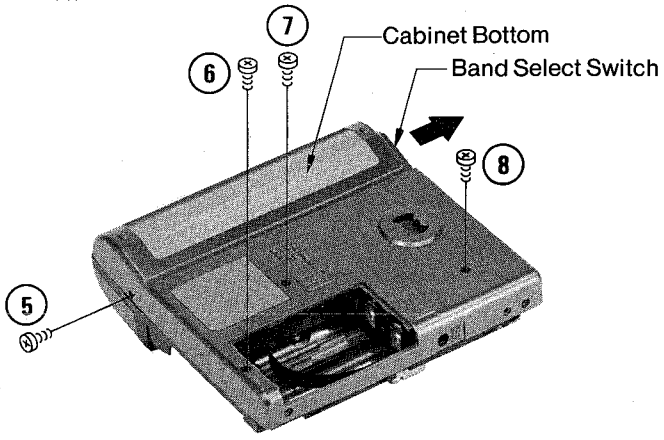
2. Remove the Lid by lifting it in the direction of the arrow.

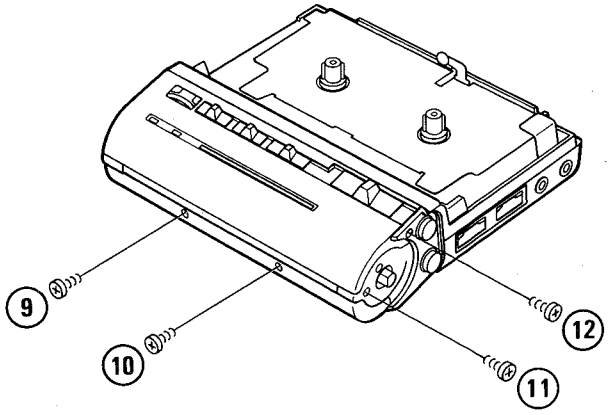
3. Reassemble in reverse order.

CABINET BOTTOM REMOVAL

1. After the detaching the cassette compartment lid, pull out the Band Select Knob from the unit.

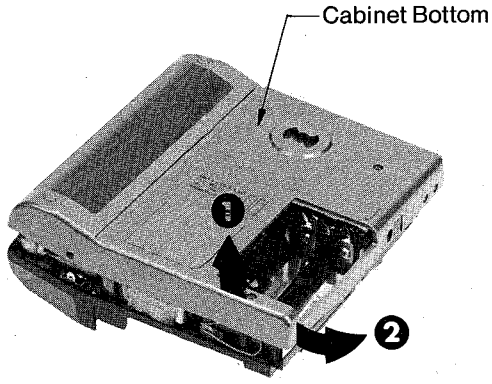
2. Remove the eight screws (5 ~ 12) fastening the Cabinet Bottom.





DISASSEMBLY INSTRUCTIONS (Continued)

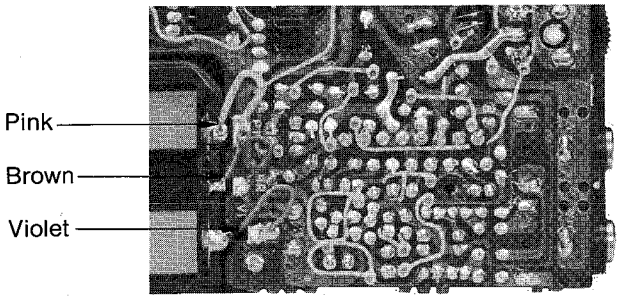
3. Lift the battery terminal side of the Cabinet Bottom so far as the Amplifier P.C.Board is observed and turn the Cabinet Bottom in the direction of the arrow 2.
   Then, remove the Cabinet Bottom from the unit.

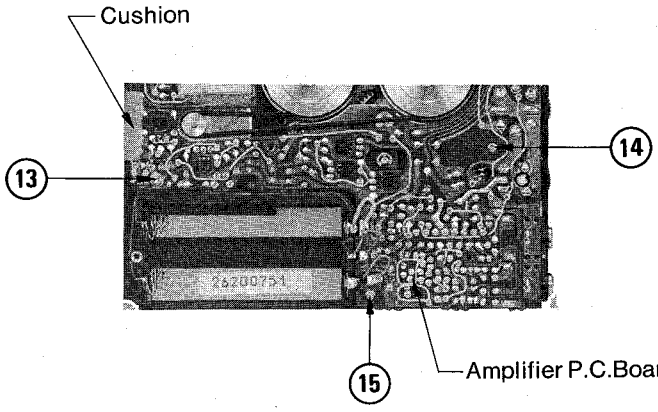


4. Reassemble in reverse order.

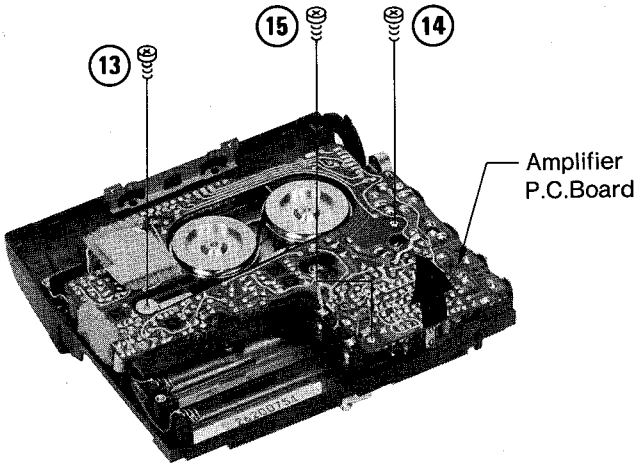
AMPLIFIER P.C.BOARD REMOVAL

1. Remove the Cabinet Bottom by following the instructions for it and disconnect the three leads (pink, brown, and violet), running to the battery terminal, from the Amplifier P.C.Board.
2. Carefully remove the Cushion from the P.C.Board and remove the three screws (13 ~ 15) fastening the Amplifier P.C.Board.





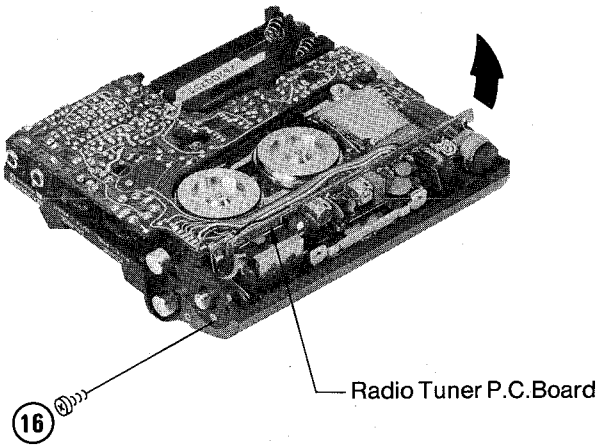
3. Remove the Amplifier P.C.Board by lifting the Ext. Power Jack side.



4. Reassemble in reverse order.

RADIO TUNER P.C.BOARD REMOVAL

1. Remove the Cabinet Bottom by following the instructions for it and remove the screw (16).
2. Remove the Radio Tuner P.C.Board, noting the leads, by lifting the Bar Antenna side.



3. Reassemble in reverse order.

NOTE:

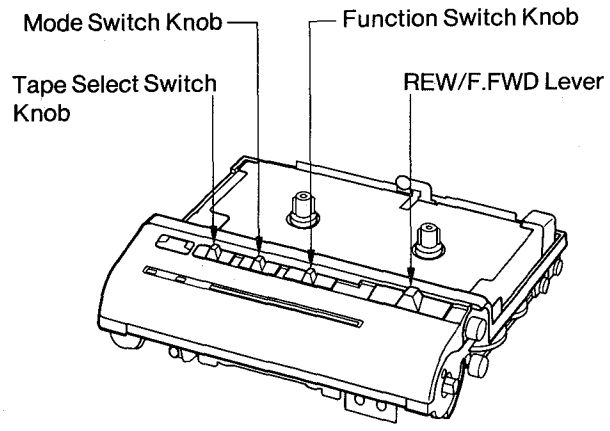
* Disconnect the antenna lead (blue) and seven leads (red, white, blue, yellow, orange, brown, and black) to completely separate the Radio Tuner P.C.Board from the unit.
* When re-mounting the Radio Tuner P.C.Board on the unit, check that the two Light Emitting Diodes (LED) are correctly inserted into the holes on the Front Cover.

DISASSEMBLY INSTRUCTIONS (Continued)

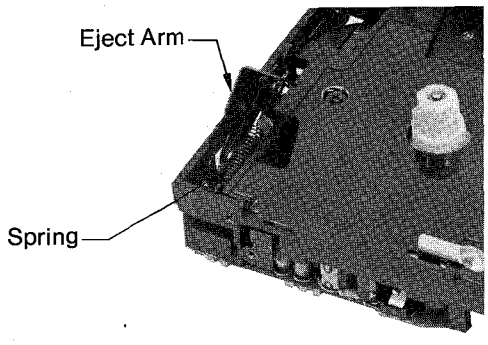
MECHANISM CHASSIS REMOVAL

1. Remove the Radio Tuner P.C.Board by following the instructions for it and remove the three leads (pink, brown, and violet) for the power supply.

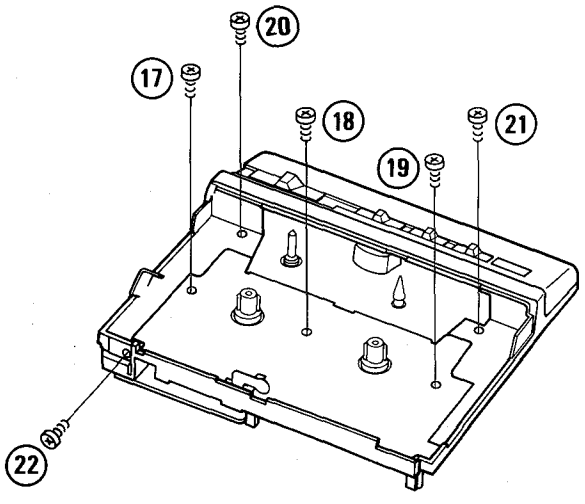
2. Pull out the REW/F.FWD Lever and the Function, Mode, and Tape Select Switch Knobs from the unit.



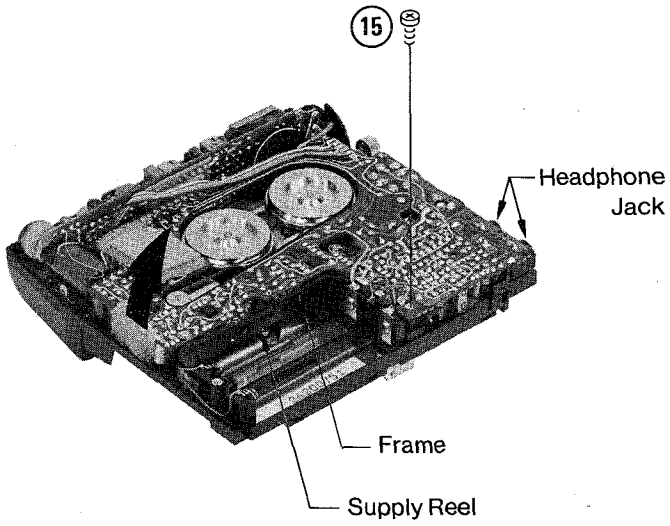
3. Remove the Eject Arm by disengaging the Spring from the unit.



4. Remove the three screws (17 ~ 19) fastening the Chassis Panel and detach the Panel. Then, remove the three screws (20 ~ 22) fastening the Chassis.



5. Remove the screw (15) fastening the Amplifier P.C.Board and lift the Motor side of the Mechanism Chassis so far as the Supply Reel touches the Frame.
Remove the Mechanism Chassis together with the Amplifier P.C.Board from the Frame by lifting the Headphone Jack side of the Chassis while keeping the above condition.

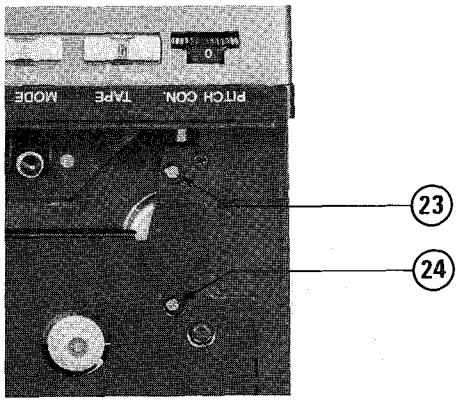


MOTOR REPLACEMENT

1. Remove the Cassette Compartment Lid, the Cabinet Bottom, and Amplifier P.C.Board by following the instructions for them.

2. Disengage the Drive Belt and remove the two screws (23 and 24) fastening the Motor. Then, remove the Motor from the unit.

NOTE:
After the Motor has been replaced, secure the screws (23 and 24) with paint or glue.



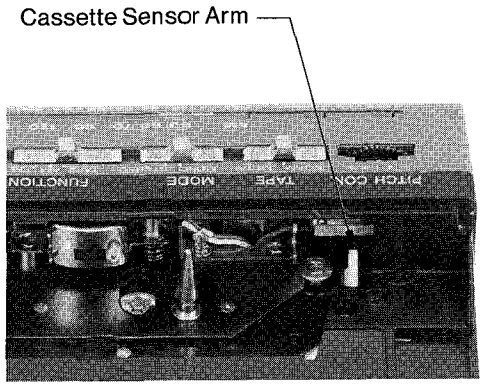
ADJUSTMENTS

GENERAL REMARKS

1. Before the adjustments, wipe off stains on the tape contacting surfaces of the parts and the belt with a soft cloth soaked in alcohol. Trouble may occur because of oil and grease stains.

2. Carefully handle the belt because grease easily attaches to it.

3. When a cassette is not inserted into the compartment and the Play button is pressed, the Motor rotates but the Slide Base does not move forward because the Cassette Sensor Arm is not pushed.



4. When the batteries are almost used up and the Play button is pressed, the Slide Base stops halfway, making it difficult to remove the cassette tape from the compartment. To avoid this, replace the batteries with new ones beforehand.

EQUIPMENT REQUIRED

- Cassette-type Torquemeter
- VTVM (2 sets)
- Frequency Counter
- Dualtrace Synchroscope
- DC Constant-voltage Regulator
- Dummy Load (33Ω)
- Test Tapes
  - * 3kHz Test Tape (Example: TEAC MTT-111) for Tape Speed Adjustment
  - * 10kHz Test Tape (Example: TEAC MTT-114) for Head Azimuth Adjustment
- Alignment Tool

NOTE:

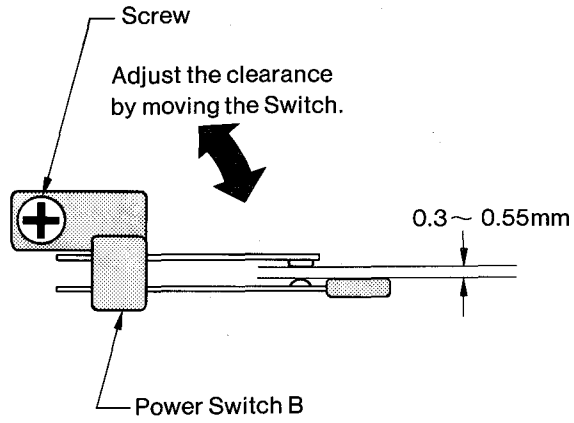
1. Supply 3.0V DC from the constant-voltage regulator to the Ext. Power Jack.
2. Two kinds of Amplifier P.C.Boards are used for M-G2. Please refer to "Amplifier P.C.Board Diagram" for the repair or adjustment work.
3. Before performing the adjustment, set the unit as follows:
   - * Function Switch ..... TAPE
   - * Tape Select Switch ..... NORM
   - * Balance Control ..... "0" (center)
   - * Pitch Control ..... "0" (click position).

POWER SWITCH B ADJUSTMENT

This Switch is electrically connected in parallel with the Power Switch A mounted on the Amplifier P.C.Board.
When the Play button is pressed, the Power Switch A is turned on, the Motor starts rotating, and the Slide Base moves forward. Then, this Power Switch B is turned on.

1. The clearance between the contacts of the Power Switch B should be 0.3～ 0.55mm when the unit is in the stop mode.

2. If necessary, loosen the screw fastening the switch and move the Switch as illustrated.

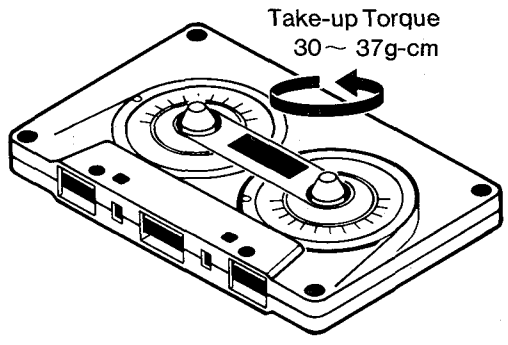


3. After the adjustment, tighten the screw and secure it with paint or glue.

NOTE:
This Switch is designed to prevent the Slide Base to stop halfway when the Play button is not pressed until it locks.

TAKE-UP TORQUE ADJUSTMENT

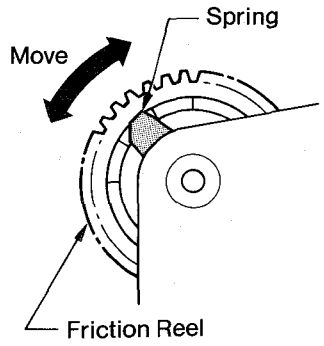
1. Insert a cassette-type torquemeter into the unit and set the unit in the playback mode. Check that the torquemeter reads 30～ 37g-cm.



Cassette-type Torquemeter

ADJUSTMENTS (Continued)

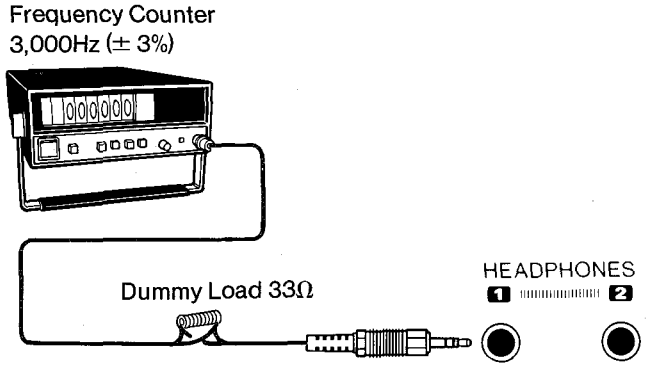
2. If necessary, adjust the torque by moving the Spring of the Friction Reel.



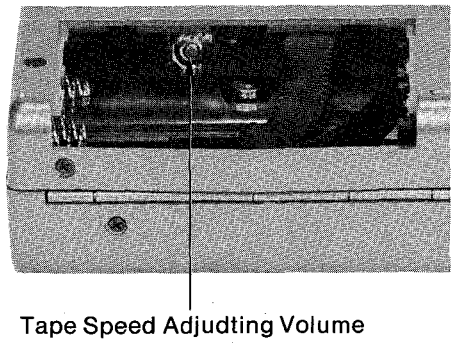
TAPE SPEED ADJUSTMENT

1. Remove the Battery Compartment Lid from the unit and insert a 3kHz test tape (Example: TEAC MTT-111) into the unit.

2. Connect the frequency counter to the headphone jack as illustrated and play back the test tape.



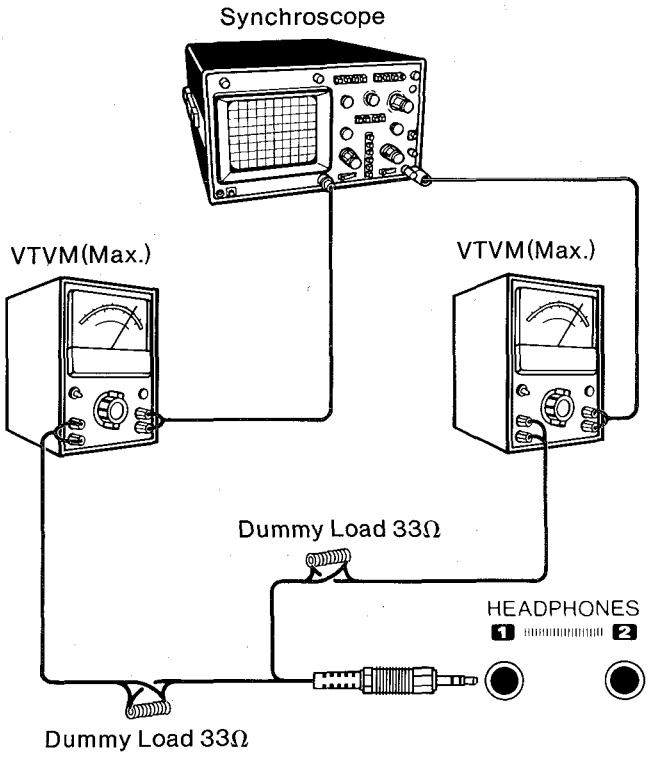
3. While playing back the test tape, adjust the tape speed by turning the potentiometer (P501) on the Amplifier P.C.Board until the frequency counter reads 3kHz (± 3%).



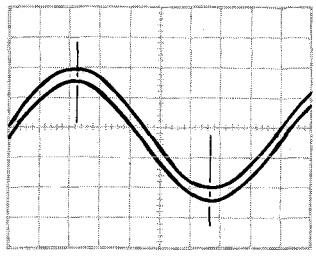
HEAD AZIMUTH ADJUSTMENT

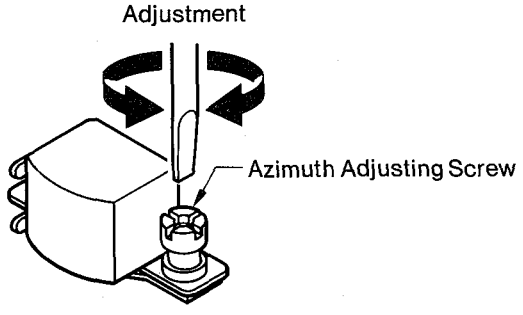
1. Connect two VTVMs and a synchroscope to the headphone jack as illustrated.
   Set the synchroscope as follows:
   * MODE ..... CHOP (chopped)
   * SOURCE ..... INT (internal), CH1 or CH2
   * SWEEP MODE ..... AUTO (automatic)

2. Insert a 10kHz test tape (Example: TEAC MTT-114) into the unit and play it back.



3. While playing back the test tape, slowly turn the azimuth adjusting screw until the amplitudes of both channel output wave forms become maximum and the wave forms overlap as well as possible in the maximum condition of the VTVM as illustrated.





4. After the adjustment, secure the adjusting screw with paint or glue.

TUNER ADJUSTMENT

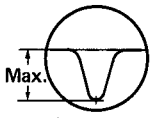
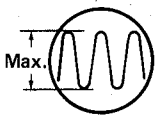
EQUIPMENT REQUIRED

- AM Standard Signal Generator
- FM Standard Signal Generator
- Generator Scope
- Loop Antenna
- Dummy Antenna (75Ω , unbalanced type) for FM
- VTVM
- Frequency Counter
- Oscilloscope
- Dummy Load (33Ω)
- Alignment Tool
- Before performing the adjustment, set the unit as follows:
  * Function Switch ..... AM or FM
  * Mode Switch ..... MONO
  * Balance Control ..... "0" (center)

NOTE:
Use an alignment tool with plastic grip for all adjustments.

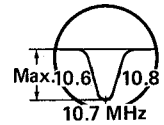
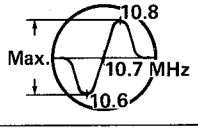
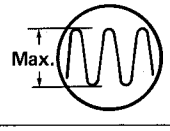
AM ALIGNMENT

Standard Test Frequency 400Hz and Modulation 30% at AM

Step	Alignment	Connections		Frequency of Signal Generator	Tuning Dial Setting	Adjustments	Remarks
		INPUT	OUTPUT				
1	Calibration of IF for AM	Connect loop antenna to AM signal generator. Place loop antenna 60cm away from bar antenna.	Connect VTVM with 33Ω dummy load and oscilloscope to Headphone jack.	460kHz	Low End	T3 and T4	Obtain symmetrical curve and maximum amplitude. 
2	Calibration of Tuning Range			510kHz		T6	Obtain sine-wave of 400Hz and maximum amplitude. 
3				1,670kHz	High End	TC4 (PVC)	
4	Adjustment of Tracking			600kHz	600kHz	L5 (bar ant. coil)	
5				1,400kHz	1,400kHz	TC3 (PVC)	
6	Repeat the above adjustment.						

FM ALIGNMENT

Standard test frequency 400Hz and deviation 22.5kHz

Step	Alignment	Connections		Frequency of Signal Generator	Tuning Dial Setting	Adjustments	Remarks
		INPUT	OUTPUT				
1	Calibration of IF	Connect output terminal of gene-scope to Pin 3 (TP2) of IC1 through ceramic capacitor (10pF).	Connect input terminal of gene-scope to Pin 7 (TP3) of IC2.	10.7MHz	Low End	Fully turn T2 counter-colckwise. Then, adjust T1.	Obtain symmetrical curve and maximum amplitude. 
2						T2	Obtain **S** curve and maximum amplitude. 
3	Calibration of Tuning Range	Connect FM signal generator to antenna terminal (TP1) through dummy antenna (75Ω , unbalanced type).	Connect VTVM with 33Ω dummy load and oscilloscope to Headphone jack.	87.35MHz		L2	Obtain sine-curve and maximum amplitude. 
4				108.25MHz	High End	TC2 (PVC)	
5	Adjustment of Tracking			98MHz	98MHz	L1	
6				106MHz	106MHz	TC1 (PVC)	
7	Repeat the above adjustment.						

TUNER ADJUSTMENT (Continued)

FM MPX (Multiplex) ADJUSTMENT

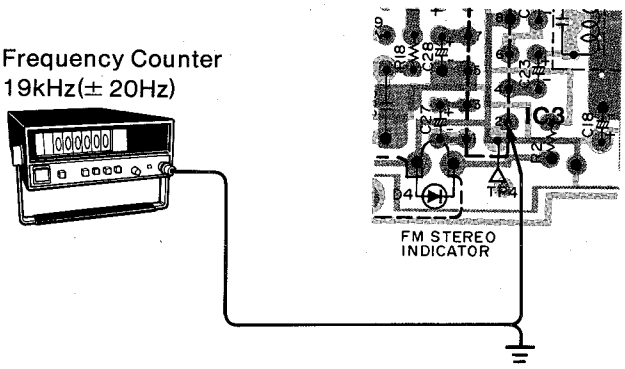
19kHz (V.C.O.) ADJUSTMENT

Before performing the adjustment, set the unit as follows:

- Function Switch ..... FM
- Mode Switch ..... STEREO

1. Connect the Frequency Counter to the second pin (Test Point TP4) in IC3 (BA1360).

2. Adjust the potentiometer (P1) until the oscillation frequency of IC3 becomes 19kHz (± 20Hz) on the frequency counter.



DIAL CORD STRINGING

1. Mount the Drum on the shaft of the variable condenser and turn the Drum fully counterclockwise.

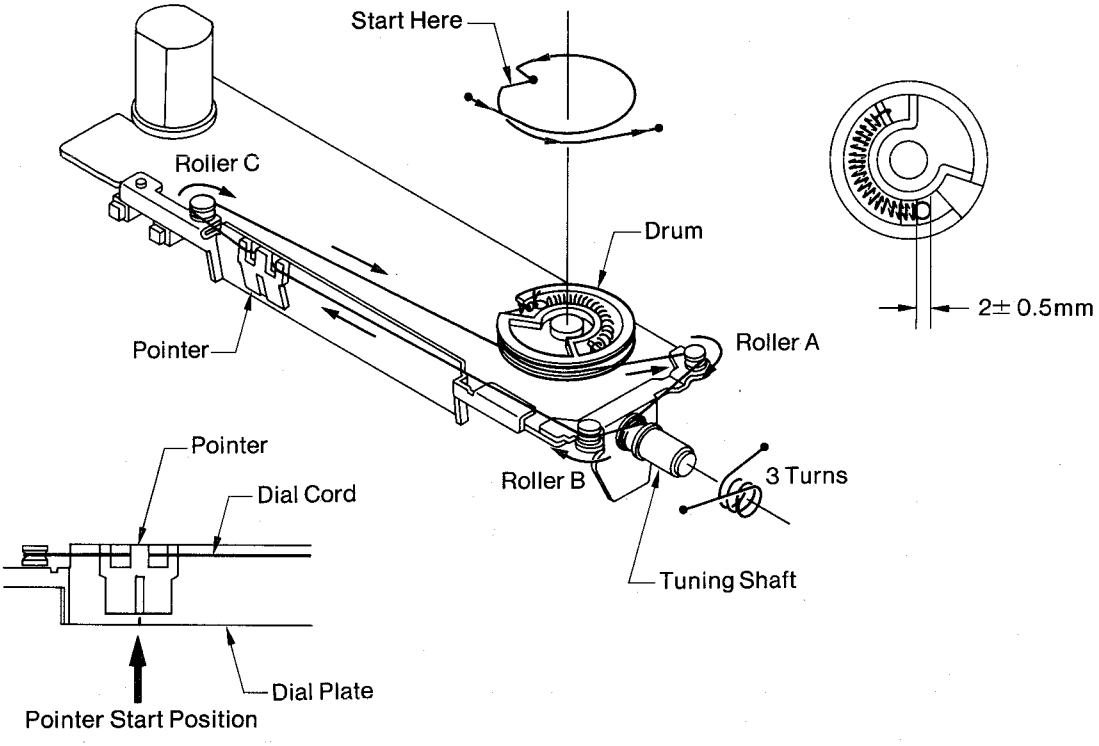
2. Tie the Dial Cord of length 400mm (effective length: 300mm) and diameter ϕ0.3 to the Spring and hook the Spring to the illustrated position of the Drum.

3. Engage the dial cord as illustrated in the following order.
   Drum → Roller A → Tuning Shaft (3 turns) → Roller B → Roller C → Drum → Spring

4. Hook the dial cord to the Spring and tie the cord where the Spring tip extends to the position specified in the illustration. Secure the knot of the dial cord with paint or glue.

5. Turn the tuning shaft counterclockwise until it stops and set the pointer over the mark on the Dial Plate as illustrated. Then, attach the Pointer to the dial cord.

6. Apply white lacquer to the Pointer to secure.



PARTS LIST

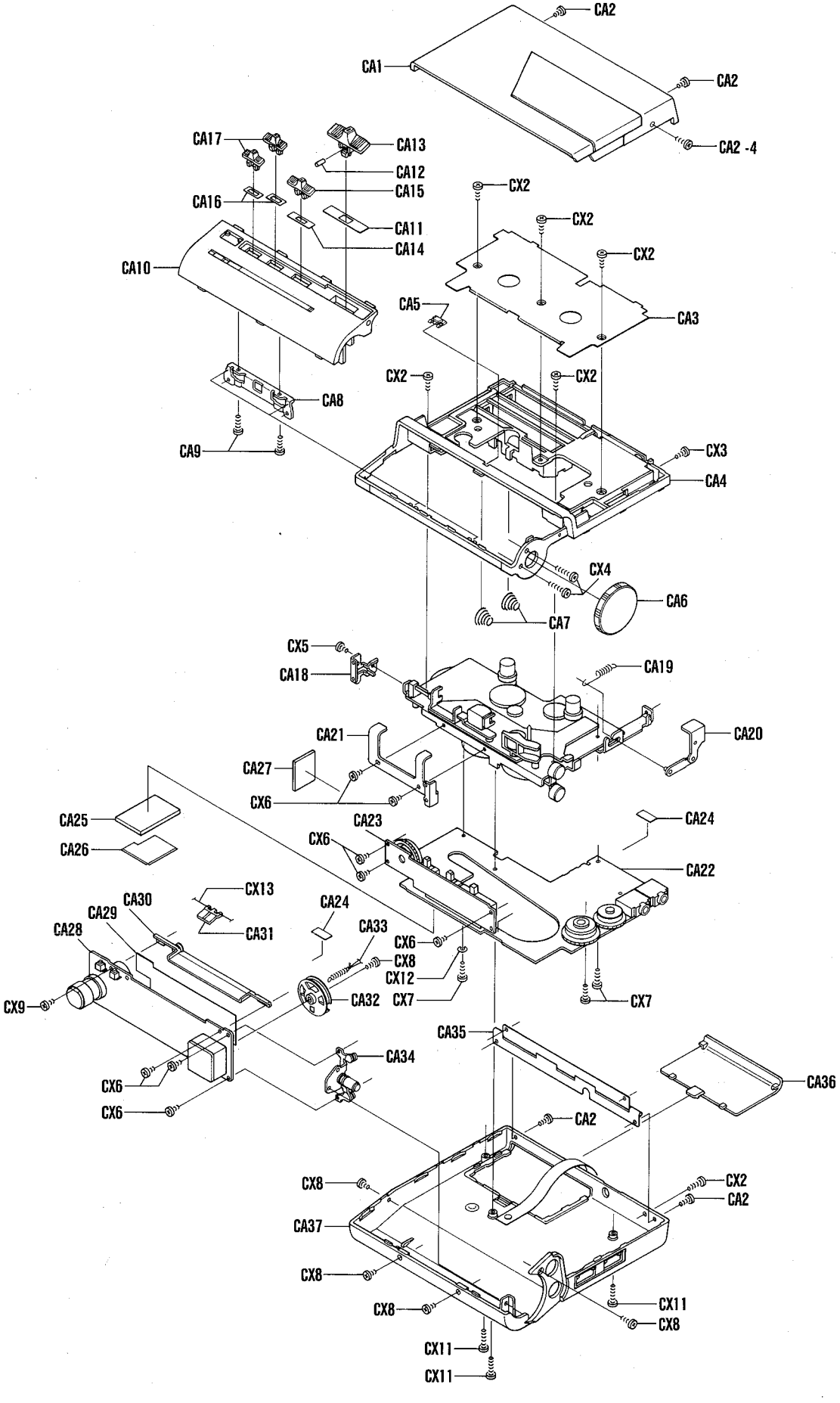
Ref. No.	Part No.	Description		Q'ty
	PACKAGE			
	141 6 1419 62303	Individual Carton		1
	141 6 2519 06010	Poly Cover 60 x 100		1
	141 6 2519 12090	Poly Cover		1
	141 6 2519 13028	Poly Cover 130 x 280		1
	141 6 3119 19800	Pad		2
	141 6 3119 21100	Cushion		1
	141 6 4559 00100	Serial No. Sheet		3
	141 6 4729 37313	Label W (Gray)		3
	141 6 4729 37300	Label, Red (Red)		3
	ACCESSORIES			
*	4 1529 70262	Headphone [HD-M25]		1
*	4 1529 70292	Headphone [HD-M25]		1
	4 2419 73973	Cassette		1
	141 0 1119 84601	Completed Battery Case		1
	141 0 1259 02501	Holder Set Assy		1
	141 0 2719 01200	Shoulder Strap Assy		1
	141 6 4419 18100	Caution Tag		1
	142 6 4119 31571	Instruction Book		1
	141 6 4519 19400	Warranty Card		1
	HEADPHONES			
*	4 1529 70262	Headphone [HD-M25]		1
1	4 2369 73560	Plug Cord		1
2	141 2 3529 36700	Tube		2
3	141 2 4469 41100	Ear Pad		2
4	4 1519 71230	Ear Speaker		2
5	141 2 1259 04500	Housing		2
6	141 2 1769 06304	Hanger, L		1
7	141 2 1769 06305	Hanger, R		1
8	141 2 8219 32400	Stopper		2
9	141 2 3529 36800	Slide Adjustor		2
10	141 2 1769 06400	Slider		1
*	4 1529 70292	Headphone [HD-M25]		1
1	4 2369 73660	Plug Cord		1
2	141 2 3529 37100	Tube		2
3	141 2 4469 42000	Ear Pad		2
4	4 1519 71350	Ear Speaker		2
5	141 2 1259 05000	Housing		2
6	141 2 1769 07004	Hanger, L		1
7	141 2 1769 07005	Hanger, R		1
8	141 2 8219 32800	Stopper		2
9	141 2 3529 37000	Slide Adjustor		2
10	141 2 1769 06900	Slider		1
	CABINET			
	141 2 2899 14000	Adhesive Sheet		2
CA1	141 0 1249 21803	Cassette Lid Assy (Gray)		1
CA1	141 0 1249 21804	Cassette Lid Assy (Red)		1
CA2	141 2 4219 28601	Screw, Pan Hd.	+M1.7x2.0	4
CA2-4	141 2 4219 24201	Screw, Pan Hd.	+M1.4x3.0	1
CA3	141 2 1219 22101	Chassis Panel		1
CA4	141 0 1149 09700	Frame Assy		1
CA5	141 2 2419 26300	Azimuth Cover		1
CA6	141 2 1639 48200	Tuning Knob		1
CA7	141 2 3829 19500	Spring, Battery		2
CA8	141 2 2149 17600	Frame Bracket		1
CA9	141 2 4219 26001	Screw	+M1.7x6.0	2
CA10	141 0 1119 85003	Front Cover Assy (Gray)		1

Ref. No.	Part No.	Description		Q'ty
CA10	141 0 1119 85004	Front Cover Assy (Red)		1
CA11	141 2 2419 26400	Sheet, FF/REW Knob		1
CA12	141 2 7539 22200	Shaft, Function Knob		1
CA13	141 2 1649 18300	Function Knob		1
CA14	141 2 2419 26600	Sheet, Function Knob		1
CA15	141 2 1649 18400	Tape Select Knob		1
CA16	141 2 2419 26500	Sheet, Tape Select Knob		2
CA17	141 2 1649 18500	Band Select Knob		2
CA18	141 2 3659 18600	Bracket, Switch Left		1
CA19	141 2 8549 13400	Spring, Eject		1
CA20	141 0 2529 00600	Eject Arm Assy		1
CA21	141 2 3659 18500	Bracket, Switch Right		1
CA22	4 1329 77790	Amplifier P.C.B. Assy **[See PCB1]**		1
CA23	4 1329 77780	Switch P.C.B. Assy **[See PCB2]**		1
CA24	141 2 4359 24900	Insulator		2
CA25	141 2 4469 39000	Cushion		1
CA26	141 2 3229 37400	Shield Plate		1
CA27	141 2 4469 40300	Cushion		1
CA28	4 1259 71683	Radio Tuner P.C.B. Assy **[See PCB3]**		1
CA29	141 2 4359 31400	Sheet, Switch PCB		1
CA30	141 0 1519 01200	Dial Plate Assy		1
CA31	141 2 8219 31800	Pointer		1
CA32	141 2 5389 03900	Drum		1
CA33	141 2 8549 14200	Spring		1
CA34	141 0 3519 21300	Tuning Bracket Assy		1
CA35	141 0 2519 00800	Hinge Assy (Gray)		1
CA35	141 0 2519 00802	Hinge Assy (Red)		1
CA36	141 2 1339 27600	Battery Lid (Gray)		1
CA36	141 2 1339 27602	Battery Lid (Red)		1
CA37	141 0 1119 85404	Cabinet Bottom Assy (Gray)		1
CA37	141 0 1119 85405	Cabinet Bottom Assy (Red)		1
CX2	127 3 1317 03018	PI Screw-1, Pan Hd.	+M1.7x3.0	6
CX3	127 3 1317 01613	PI Screw-1, Pan Hd.	+M1.7x1.6	1
CX4	127 3 1317 08013	PI Screw-1, Pan Hd.	+M1.7x8.0	2
CX5	128 3 1314 01613	PI Screw-3, Pan Hd.	+M1.4x1.6	2
CX6	128 3 1314 02013	PI Screw-3, Pan Hd.	+M1.4x2.0	8
CX7	127 3 1317 04013	PI Screw-1, Pan Hd.	+M1.7x4.0	3
CX8	127 3 1317 02018	PI Screw-1, Pan Hd.	+M1.7x2.0	4
CX9	128 3 1314 04013	PI Screw-3, Pan Hd.	+M1.4x4.0	1
CX11	127 3 1317 06018	PI Screw-1, Pan Hd.	+M1.7x6.0	3
CX12	110 3 2101 70013	Spring Washer-2	+M1.7	1
CX13	629 3 0904 00000	Dial String 0.3ϕ		1

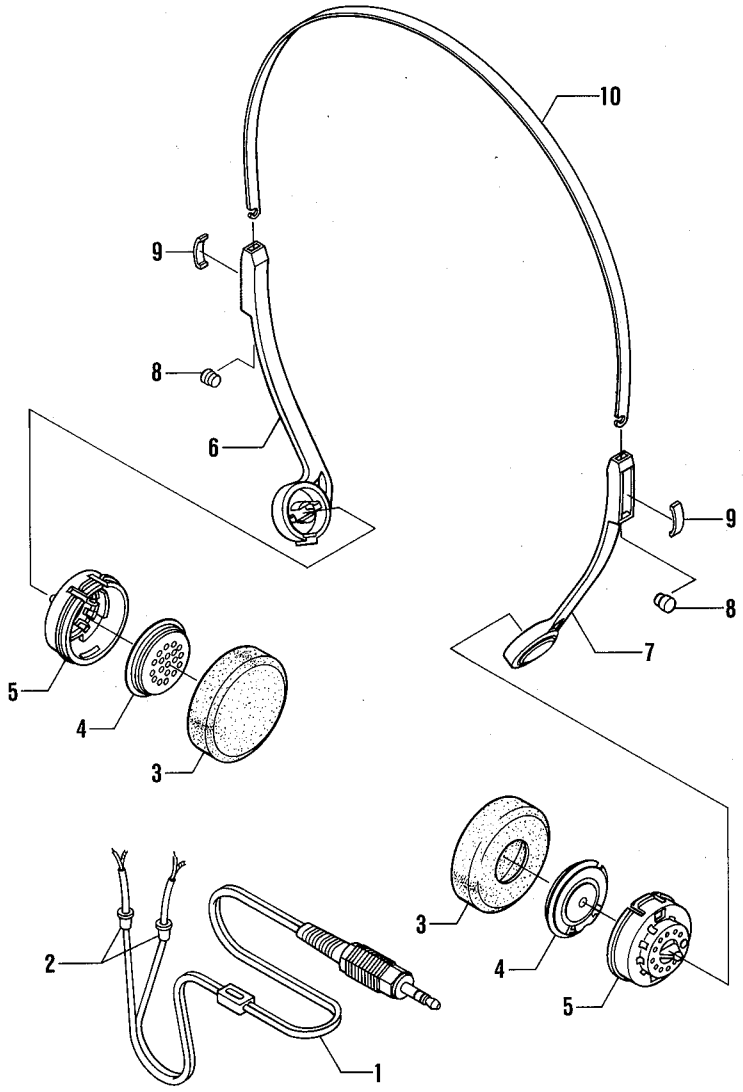
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

CABINET EXPLODED VIEW



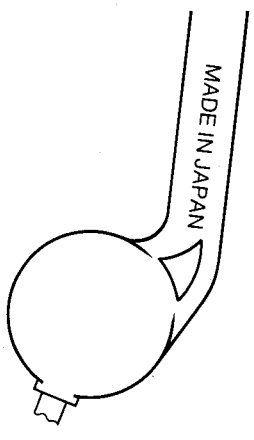
HEADPHONE EXPLODED VIEW



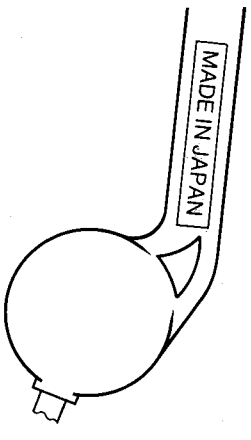
Note that the Headphone attached with PH33 is classisied into the following two kinds.

Product code	Name
4 1529 70262	HD-M25
4 1529 70292	HD-M25

4 1529 70262



4 1529 70292



CLASSISICATION

1. Obseve the inside of the Hanger on the left side (No.6 in the Exploded View).
   "MADE IN JAPAN" on one model is framed and that on the other model is not.

2. Refer to the Patrs List of the Headphone for the details.

MECHANISM PARTS LIST

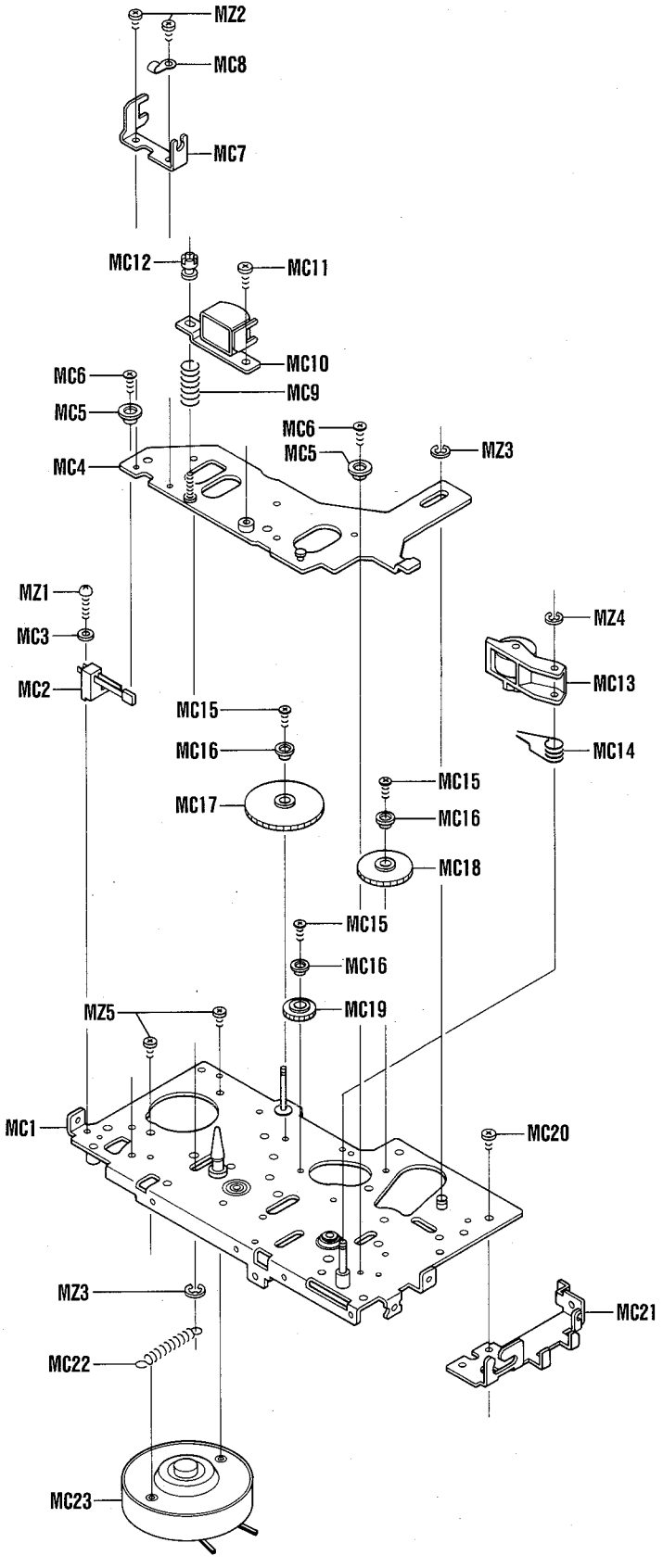
Ref. No.	Part No.	Description		Q'ty
	MECHANISM			
MC1	141 0 3119 20901	Chassis Assy		1
MC2	4 2319 75410	Leaf Switch (Power B) [S5]		1
MC3	141 2 4579 04500	Washer		1
MC4	141 0 7319 25100	Slide Base Assy		1
MC5	141 2 3529 34500	Spacer, Slide Base		2
MC6	141 2 4219 27600	Screw, Flat Hd.	+M1.4x2.5	3
MC7	141 2 8219 31500	Tape Guide		1
MC8	141 2 4729 06500	Lug		2
MC9	141 2 8559 02300	Spring, Azimuth		1
MC10	4 2429 72150	Head Play [HD1]		1
MC11	141 2 4219 10801	Screw		1
MC12	141 2 4179 02200	Nut, Head		1
MC13	141 0 5419 03801	Pinch Roller Arm Assy		1
MC14	141 2 8529 09100	Spring, Pinch Roller		1
MC15	141 2 4219 27500	Screw, Flat Hd.	+M1.4x3.0	3
MC16	141 2 3529 34800	Spacer, Rewind Gear		3
MC17	141 2 5519 43800	Rewind Second Gear		1
MC18	141 2 5519 44300	FF Gear		1
MC19	141 2 5519 43900	Rewind First Gear		1
MC20	141 2 4219 09000	Screw		1
MC21	141 2 2529 05200	Eject Bracket		1
MC22	141 2 8549 12500	Spring, Slide Base		1
MC23	4 5279 71152	Motor [M1]		1
MC24	141 0 7419 35100	Stop Lever Assy		1
MC25	141 2 8549 12800	Spring, Play Lever		2
MC26	141 0 7419 35200	Completed Play Lever		1
MC27	141 2 4569 05700	Washer		3
MC28	141 0 7319 24900	Lock Plate Assy		1
MC29	141 2 8549 12600	Spring, Lock Plate		1
MC30	141 2 7419 78801	Switch Lever		1
MC31	141 2 4539 27602	Washer		2
MC32	141 0 5219 08800	Flywheel Assy		1
MC33	141 2 5649 19200	Drive Belt		1
MC34	141 2 5649 19100	Take-up Belt		1
MC35	141 0 5219 08700	Sub Flywheel Assy		1
MC36	141 2 8529 09300	Spring, Slide Base Gear		1
MC37	141 2 8549 12400	Spring, Power Gear Lock		1
MC38	141 2 4539 17500	Washer		5
MC39	141 2 7439 29000	Power Gear Lock		1
MC40	141 2 5519 43700	Slide Base Gear		1
MC41	141 0 7419 35000	Fast Lever Assy		1
MC42	141 2 3529 34300	Spacer, Fast Lever		1
MC43	141 2 7419 78700	Select Lever		1
MC44	141 0 7319 25000	Cancel Plate Assy		1
MC45	141 0 3519 20800	Reel Plate Assy		1
MC46	141 2 4539 18400	Washer		1
MC47	141 0 5319 06700	Friction Reel Assy		1
MC48	141 2 4539 18100	Washer		2
MC49	141 2 5519 44400	Take-up Pulley		1
MC50	141 2 5519 44500	Fast Gear		1
MC51	141 2 4539 19200	Washer		2
MC52	141 2 5519 44000	Power Gear		1
MC53	141 2 8559 02600	Spring, Shut-off Arm		1
MC54	141 2 7439 28900	Shut-off Arm		1
MC55	141 2 8529 09200	Spring, ASO Cancel		1
MC56	141 2 4219 27700	Screw, Pan Hd.	+M1.4x2.5	1
MC57	141 2 3529 34700	Spacer, Take-up Arm		1
MC58	141 2 8549 12900	Spring, Take-up Arm		1
MC59	141 0 7439 11000	Take-up Gear Arm Assy		1
MC60	141 2 8529 09000	Spring, Sensor Arm		1
MC61	141 2 4219 27800	Screw, Pan Hd.	+M1.7x4.0	1
MC62	141 2 3529 35800	Spacer, Sensor Arm		1
MC63	141 2 7439 30200	Cassette Sensor Arm		1
MC64	141 2 8559 02500	Spring, Supply		1
MC65	141 0 5369 01800	Supply Reel Assy		1
MC66	141 2 4539 27601	Washer		2
MC67	141 2 4579 04400	E Ring		2
MC68	141 2 8549 12700	Spring, Base Lock Arm		1
MZ1	128 3 1314 03513	PI Screw-3, Pan Hd.	+M1.4x3.5	1
MZ2	127 3 1317 01613	PI Screw-1, Pan Hd.	+M1.7x1.6	2
MZ3	112 3 1302 00082	E Ring	M2.0	3
MZ4	112 3 1301 50082	E Ring	M1.5	11
MZ5	127 3 1317 02013	PI Screw-1, Pan Hd.	+M1.7x2.0	2
MZ6	127 3 1317 03013	PI Screw-1, Pan Hd.	+M1.7x3.0	3

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

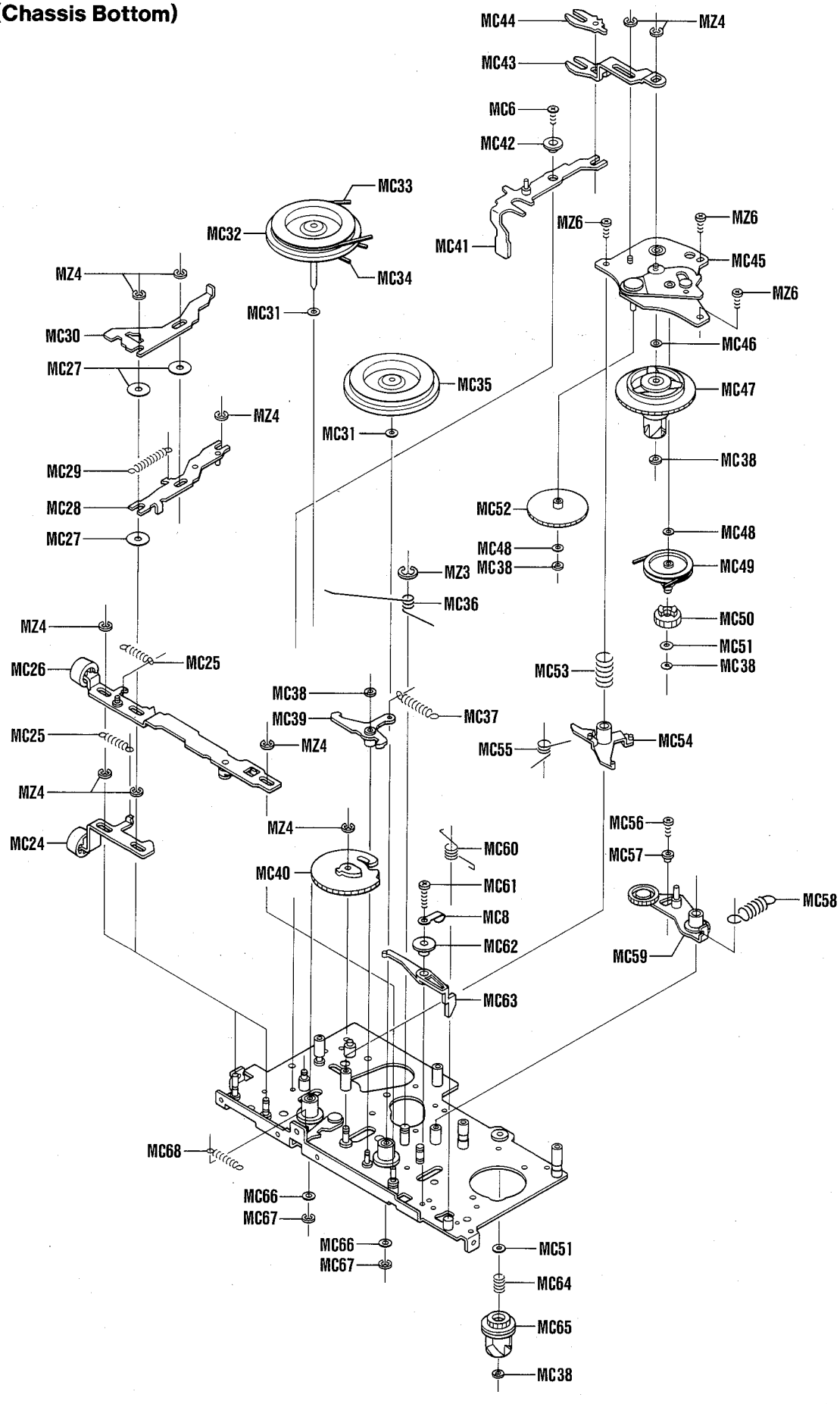
MECHANISM EXPLODED VIEW

(Chassis Top)



MECHANISM EXPLODED VIEW (Continued)

(Chassis Bottom)



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description			Q'ty
	AMPLIFIER P.C.B. ASSY				
PCB1	4 1329 77790	Amplifier P.C.B. Assy			1
	141 2 1639 48300	Volume Knob			1
	141 2 1639 48400	Balance Knob			1
	141 2 4219 10601	Screw	+M1.7x4.0		1
	141 2 4729 05000	Staple, 5mm			12
	128 3 1217 04518	PI Screw-3, Flat Hd.	+M1.7x4.5		1
	4 2439 71740	Flat Wire 15			1
J1	4 2359 75140	1P Jack (Headphone 1)			1
J2	4 2359 75140	1P Jack (Headphone 2)			1
J3	4 2359 74320	Ext. Power Jack			1
S4	4 2319 74590	Leaf Switch (Power A)			1
VR1	4 2229 73400	Volume Control (Volume/A-20kΩ)			1
VR2	4 2229 71914	Volume Control (Balance/ W-20kΩ)			1
L101	4 2539 71001	Choke Coil (8.2μH)			1
L102	4 2539 70991	Choke Coil (2.2μH)			1
L201	4 2539 71001	Choke Coil (8.2μH)			1
L202	4 2539 70991	Choke Coil (2.2μH)			1
L301	4 2539 70981	Choke Coil (10μH)			1
L501	4 2539 71050	Inductor (120μH)			1
L502	4 2539 71050	Inductor (120μH)			1
P501	4 2229 73012	Potentiometer (B-2kΩ)			1
TH501	4 2049 70030	Thermistor, 20K A			1
D301	4 2029 71590	Diode, 1SS95			1
D501	4 2029 71440	Diode, 1SS95			1
Q301	203 5 5210 53660	Transistor, 2SC 536			1
Q501	203 5 4930 80860	Transistor, 2SB 808			1
Q502	203 5 5210 53660	Transistor, 2SC 536			1
Q503	203 5 5210 53660	Transistor, 2SC 536			1
Q504	203 5 4830 60860	Transistor, 2SA 608			1
Q505	203 5 5210 53660	Transistor, 2SC 536			1
Q506	203 5 5210 53660	Transistor, 2SC 536			1
IC301	4 2069 71630	IC, BA-3304			1
IC302	4 2069 71620	IC, BA-5204			1
C101	CC1 5 2500 KE00C	Ceramic	0.0015μF	50V ± 10%	1
C102	CC4 7 1500 KE00C	Ceramic	470pF	50V ± 10%	1
C103	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C104	CD3 3 4500 0002V	Electrolytic	0.33μF	50V	1
C105	CM2 2 3500 J00MV	Mylar	0.022μF	50V ± 5%	1
C106	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C107	CD3 3 640A 0002V	Electrolytic	33μF	4V	1
C108	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C109	CI1 0 3250 KF00C	Boundary	0.01μF	25V ± 10%	1
C110	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C111	CD1 0 5500 0002V	Electrolytic	1μF	50V	1
C201	CC1 5 2500 KE00C	Ceramic	0.0015μF	50V ± 10%	1
C202	CC4 7 1500 KE00C	Ceramic	470pF	50V ± 10%	1
C203	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C204	CD3 3 4500 0002V	Electrolytic	0.33μF	50V	1
C205	CM2 2 3500 J00MV	Mylar	0.022μF	50V ± 5%	1
C206	CC1 0 2500 KE00C	Ceramic	0.001μF	50V ± 10%	1
C207	CD3 3 640A 0002V	Electrolytic	33μF	4V	1
C208	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C209	CI1 0 3250 KF00C	Boundary	0.01μF	25V ± 10%	1
C210	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C211	CD1 0 5500 0002V	Electrolytic	1μF	50V	1
C301	CD1 0 6160 0002V	Electrolytic	10μF	16V	1
C302	CD1 0 740A 0002V	Electrolytic	100μF	4V	1
C303	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C304	CI1 0 3250 KF00C	Boundary	0.01μF	25V ± 10%	1
C305	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C306	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C307	CD1 0 740A 0002V	Electrolytic	100μF	4V	1
C501	CD2 2 740A 0002V	Electrolytic	220μF	4V	1

Ref. No.	Part No.	Description			Q'ty
C502	CD2 2 663A 0002V	Electrolytic	22μF	6.3V	1
C503	CD2 2 4500 0002V	Electrolytic	0.22μF	50V	1
C504	CT1 0 463A M00AV	Tantalume	0.1μF	6.3V ± 20%	1
R101	RP2 7 3121 JH000	Pretty Carbon	27kΩ	1/8W ± 5%	1
R102	RP1 5 4121 JH000	Pretty Carbon	150kΩ	1/8W ± 5%	1
R104	RP5 6 2121 JH000	Pretty Carbon	5.6kΩ	1/8W ± 5%	1
R105	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R107	RP1 2 1121 JH000	Pretty Carbon	120Ω	1/8W ± 5%	1
R108	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R109	RP2 2 0121 JV000	Pretty Carbon	22Ω	1/8W ± 5%	1
R110	RP2 2 A121 JV000	Pretty Carbon	2.2Ω	1/8W ± 5%	1
R111	RP3 3 A121 JV000	Pretty Carbon	3.3Ω	1/8W ± 5%	1
R112	RP3 3 A121 JV000	Pretty Carbon	3.3Ω	1/8W ± 5%	1
R113	RP2 7 2121 JH000	Pretty Carbon	2.7kΩ	1/8W ± 5%	1
R114	RP1 0 1121 JV000	Pretty Carbon	100Ω	1/8W ± 5%	1
R201	RP2 7 3121 JH000	Pretty Carbon	27kΩ	1/8W ± 5%	1
R202	RP1 5 4121 JH000	Pretty Carbon	150kΩ	1/8W ± 5%	1
R204	RP5 6 2121 JH000	Pretty Carbon	5.6kΩ	1/8W ± 5%	1
R205	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R207	RP1 2 1121 JH000	Pretty Carbon	120Ω	1/8W ± 5%	1
R208	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R209	RP2 2 0121 JV000	Pretty Carbon	22Ω	1/8W ± 5%	1
R210	RP2 2 A121 JV000	Pretty Carbon	2.2Ω	1/8W ± 5%	1
R211	RP3 3 A121 JV000	Pretty Carbon	3.3Ω	1/8W ± 5%	1
R212	RP3 3 A121 JV000	Pretty Carbon	3.3Ω	1/8W ± 5%	1
R213	RP2 7 2121 JH000	Pretty Carbon	2.7kΩ	1/8W ± 5%	1
R214	RP1 0 1121 JV000	Pretty Carbon	100Ω	1/8W ± 5%	1
R301	RP2 2 1121 JH000	Pretty Carbon	220Ω	1/8W ± 5%	1
R302	RP2 2 1121 JH000	Pretty Carbon	220Ω	1/8W ± 5%	1
R303	RP1 3 3121 JH000	Pretty Carbon	13kΩ	1/8W ± 5%	1
R304	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R305	RP2 2 0121 JH000	Pretty Carbon	22Ω	1/8W ± 5%	1
R501	RP1 2 2121 JH000	Pretty Carbon	1.2kΩ	1/8W ± 5%	1
R502	RP4 7 1121 JH000	Pretty Carbon	470Ω	1/8W ± 5%	1
R503	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R504	RP8 2 2121 JH000	Pretty Carbon	8.2kΩ	1/8W ± 5%	1
R505	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R506	RP1 2 A121 JH000	Pretty Carbon	1.2Ω	1/8W ± 5%	1
R507	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R508	RP3 3 3121 JH000	Pretty Carbon	33kΩ	1/8W ± 5%	1
R509	RP3 3 2121 JH000	Pretty Carbon	3.3kΩ	1/8W ± 5%	1
R510	RP1 8 3121 JH000	Pretty Carbon	18kΩ	1/8W ± 5%	1
R511	RP1 2 3121 JH000	Pretty Carbon	12kΩ	1/8W ± 5%	1
R512	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R514	RP5 6 4121 JH000	Pretty Carbon	560kΩ	1/8W ± 5%	1
	SWITCH P.C.B. ASSY				
PCB2	4 1329 77780	Switch P.C.B. Assy			1
	141 2 1639 48100	Knob, Pitch Control			1
	141 2 4219 10601	Screw			1
S1	4 2319 75440	Slide Switch (Function)			1
S2	4 2319 75450	Slide Switch (Mode)			1
S3	4 2319 75450	Slide Switch (Tape Select)			1
VR3	4 2229 73760	Volume Control (Pitch/2.5kΩ)			1
R103	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R106	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R203	RP1 0 3121 JH000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R206	RP2 2 2121 JH000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
	RADIO TUNER P.C.B. ASSY				
PCB3	4 1259 71683	Radio Tuner P.C.B. Assy			1
	4 2439 71701	Lead Wire			1

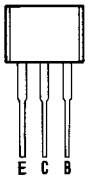
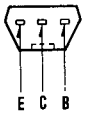
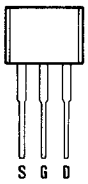
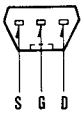
P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description			Q'ty
	141 0 4219 00200	Adjusting Core Assy			1
	141 2 3229 36700	Shield Plate, PVC			1
	141 2 3229 37100	Shield Plate, IF			1
	141 2 3229 37200	Shield Plate, IC			1
	141 2 3229 37300	Shield Plate, MPX			1
L1	4 2599 70740	RF Coil			1
L2	4 2589 71951	OSC Trans FM			1
L3	4 2539 71070	Choke Coil (18μH)			1
L4	4 2539 71140	Choke Coil (220μH)			1
L5	4 2579 71140	Bar Antenna			1
L6	4 2539 71021	Band Pass Filter			1
T1	4 2569 71160	IFT, FM			1
T2	4 2569 71410	IFT, FM			1
T3	4 2569 71191	IFT, AM			1
T4	4 2569 71201	IFT, AM			1
T5	4 2539 71080	Trap 19kHz			1
T6	4 2589 71621	OSC Trans MW			1
P1	4 2229 73035	Potentiometer (B-5kΩ)			1
PVC1	4 2249 70670	Variable Capacitor			1
CF1	4 2539 70881	Ceramic Filter			1
CF2	4 2539 70723	Ceramic Filter			1
D1	205 5 9040 44210	Diode, DS 442			1
D2	4 2029 72040	LED, SLB-23UR (Batt. Check)			1
D3	4 2029 71440	Diode, 1SS95			1
D4	4 2029 72040	LED, SLB-23UR (FM Stereo)			1
Q1	4 2039 70710	Transistor, 2SC2786			1
Q2	4 2039 70700	Transistor, 2SC2785			1
Q3	203 5 5200 21250	FET, 2SK212			1
IC1	4 2069 71590	IC, AN7213			1
IC2	4 2069 71610	IC, μPC1222C			1
IC3	4 2069 71600	IC, BA1360			1
C1	CC1 8 0500 JD00C	Ceramic	18pF	50V ± 5%	1
C2	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C3	CI2 2 3250 KE00C	Boundary	0.022μF	25V ± 10%	1
C4	CI1 0 3250 KE00C	Boundary	0.01μF	25V ± 10%	1
C5	CC1 8 0500 JD00C	Ceramic	18pF	50V ± 5%	1
C6	CI1 0 3250 KE00C	Boundary	0.01μF	25V ± 10%	1
C7	CC2 0 0500 JCH0C	Ceramic	20pF	50V ± 5%	1
C8	CC5 0 A500 CCH0C	Ceramic	5pF	50V ± 0.2pF	1
C9	CC1 5 0500 JCH0C	Ceramic	15pF	50V ± 5%	1
C10	CI2 2 3250 KE00C	Boundary	0.022μF	25V ± 10%	1
C11	CD4 7 640A 0002V	Electrolytic	47μF	4V	1
C12	CT1 0 630A M00NV	Tantalume	10μF	3V ± 20%	1
C13	CT4 7 530A M00SV	Tantalume	4.7μF	3V ± 20%	1
C14	CI4 7 3250 KE00C	Boundary	0.047μF	25V ± 10%	1
C15	CI1 0 3250 KE00C	Boundary	0.01μF	25V ± 10%	1
C16	CT4 7 3350 M00SV	Tantalume	0.047μF	35V ± 20%	1
C17	CG1 0 3500 MH00A	Chip	0.01μF	50V ± 20%	1
C18	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C19	CI2 2 3250 KE00C	Boundary	0.022μF	25V ± 10%	1
C20	CD2 2 740A 0002V	Electrolytic	220μF	4V	1
C21	CI2 2 3250 KE00C	Boundary	0.022μF	25V ± 10%	1
C22	CC8 0 A500 DD00C	Ceramic	8pF	50V ± 0.5pF	1
C23	CT1 0 563A M00AV	Tantalume	1μF	6.3V ± 20%	1
C24	CT1 0 563A M00AV	Tantalume	1μF	6.3V ± 20%	1
C25	CT4 7 463A M00AV	Tantalume	0.47μF	6.3V ± 20%	1
C26	CT2 2 463A M00AV	Tantalume	0.22μF	6.3V ± 20%	1
C27	CT1 0 563A M00AV	Tantalume	1μF	6.3V ± 20%	1
C28	CT4 7 530A M00SV	Tantalume	4.7μF	3V ± 20%	1
C29	CI6 8 2250 KE00C	Boundary	0.0068μF	25V ± 10%	1
C30	CI6 8 2250 KE00C	Boundary	0.0068μF	25V ± 10%	1
C31	CP1 0 2101 J002V	Polypropylen	0.001μF	100V ± 5%	1
C32	CI1 5 3250 KE00C	Boundary	0.015μF	25V ± 10%	1
C33	CI1 5 3250 KE00C	Boundary	0.015μF	25V ± 10%	1
C34	CT4 7 3350 M00SV	Tantalume	0.047μF	35V ± 20%	1
C35	CT4 7 3350 M00SV	Tantalume	0.047μF	35V ± 20%	1
C36	CI1 0 3250 KE00C	Boundary	0.01μF	25V ± 10%	1
C37	CI1 0 3250 KE00C	Boundary	0.01μF	25V ± 10%	1
R1	RP3 3 4121 JV000	Pretty Carbon	330kΩ	1/8W ± 5%	1
R2	RP3 3 1121 JV000	Pretty Carbon	330Ω	1/8W ± 5%	1
R3	RP1 0 0121 JV000	Pretty Carbon	10Ω	1/8W ± 5%	1
R4	RP1 0 0121 JH000	Pretty Carbon	10Ω	1/8W ± 5%	1
R5	RP2 2 3121 JV000	Pretty Carbon	22kΩ	1/8W ± 5%	1
R6	RP1 0 0121 JV000	Pretty Carbon	10Ω	1/8W ± 5%	1
R7	RP3 3 3121 JV000	Pretty Carbon	33kΩ	1/8W ± 5%	1
R8	RP1 0 5121 JV000	Pretty Carbon	1MΩ	1/8W ± 5%	1
R9	RP3 3 1121 JV000	Pretty Carbon	330Ω	1/8W ± 5%	1
R10	RP5 6 1121 JV000	Pretty Carbon	560Ω	1/8W ± 5%	1
R11	RP1 0 3121 JV000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R12	RP1 0 3121 JV000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R13	RP2 2 2121 JV000	Pretty Carbon	2.2kΩ	1/8W ± 5%	1
R14	RP1 0 2121 JV000	Pretty Carbon	1kΩ	1/8W ± 5%	1
R15	RP4 7 0121 JV000	Pretty Carbon	47Ω	1/8W ± 5%	1
R16	RP8 2 0121 JT000	Pretty Carbon	82Ω	1/8W ± 5%	1
R17	RP1 0 2121 JV000	Pretty Carbon	1kΩ	1/8W ± 5%	1
R18	RP1 0 2121 JV000	Pretty Carbon	1kΩ	1/8W ± 5%	1
R19	RP1 0 2121 JV000	Pretty Carbon	1kΩ	1/8W ± 5%	1
R20	RP1 0 3121 JT000	Pretty Carbon	10kΩ	1/8W ± 5%	1
R21	RP3 3 1121 JV000	Pretty Carbon	330Ω	1/8W ± 5%	1
R22	RP3 3 3121 JT000	Pretty Carbon	33kΩ	1/8W ± 5%	1
R23	RP3 3 1121 JV000	Pretty Carbon	330Ω	1/8W ± 5%	1
R24	RP3 3 1121 JV000	Pretty Carbon	330Ω	1/8W ± 5%	1

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

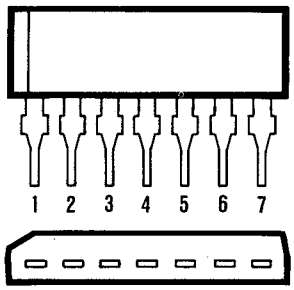
IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA608 2SB808 2SC536 2SC2768		
2SK212		

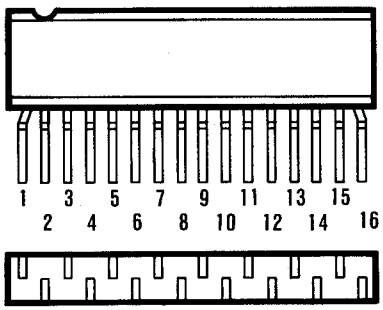
TERMINAL NAME

B → BASE　　G → GATE
C → COLLECTOR　　S → SOURCE
E → EMITTER　　D → DRAIN

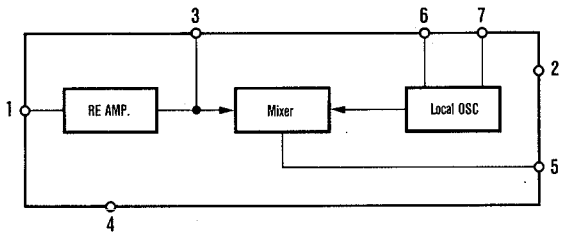
AN 7213 FRONT/BOTTOM VIEW



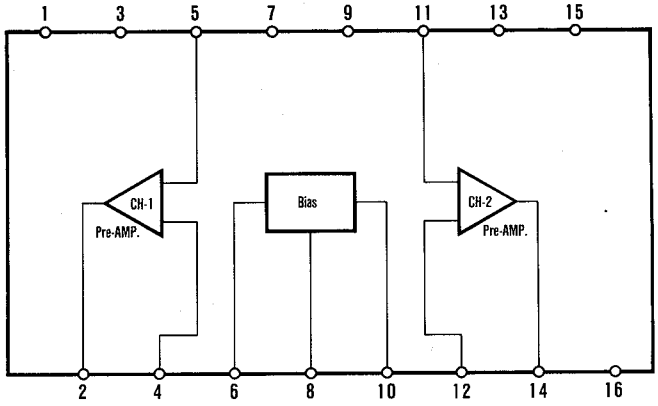
BA 1360
BA 5204 } **FRONT/BOTTOM VIEW**
BA 3304



AN 7213 BLOCK DIAGRAM

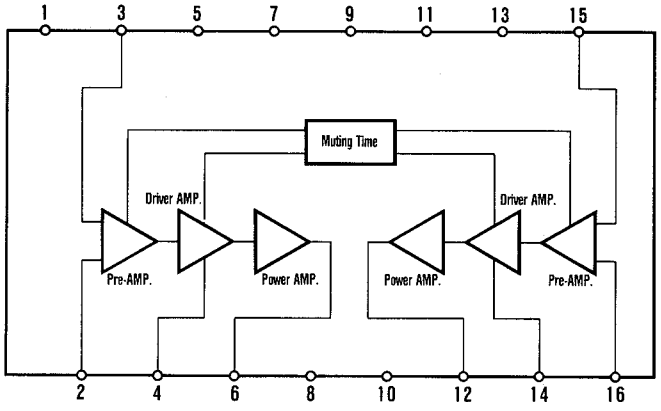


BA 3304 BLOCK DIAGRAM

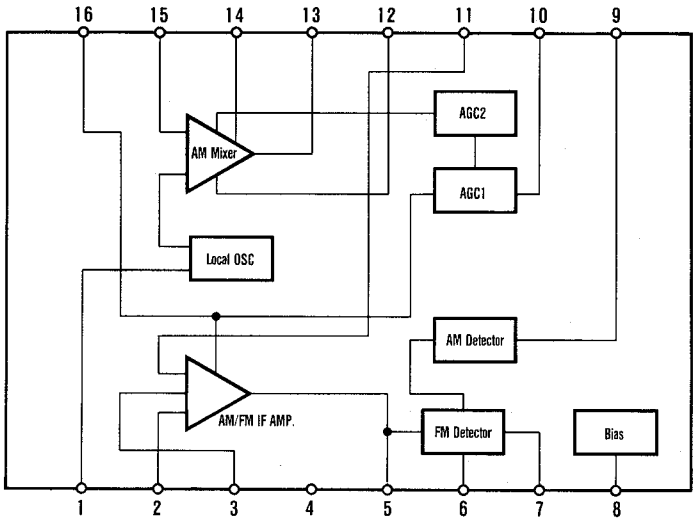


IC & TRANSISTOR LEAD IDENTIFICATION (Continued)

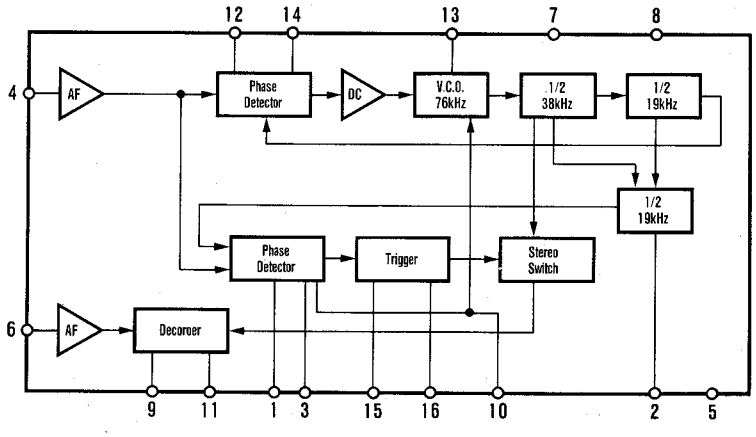
BA 5204 BLOCK DIAGRAM



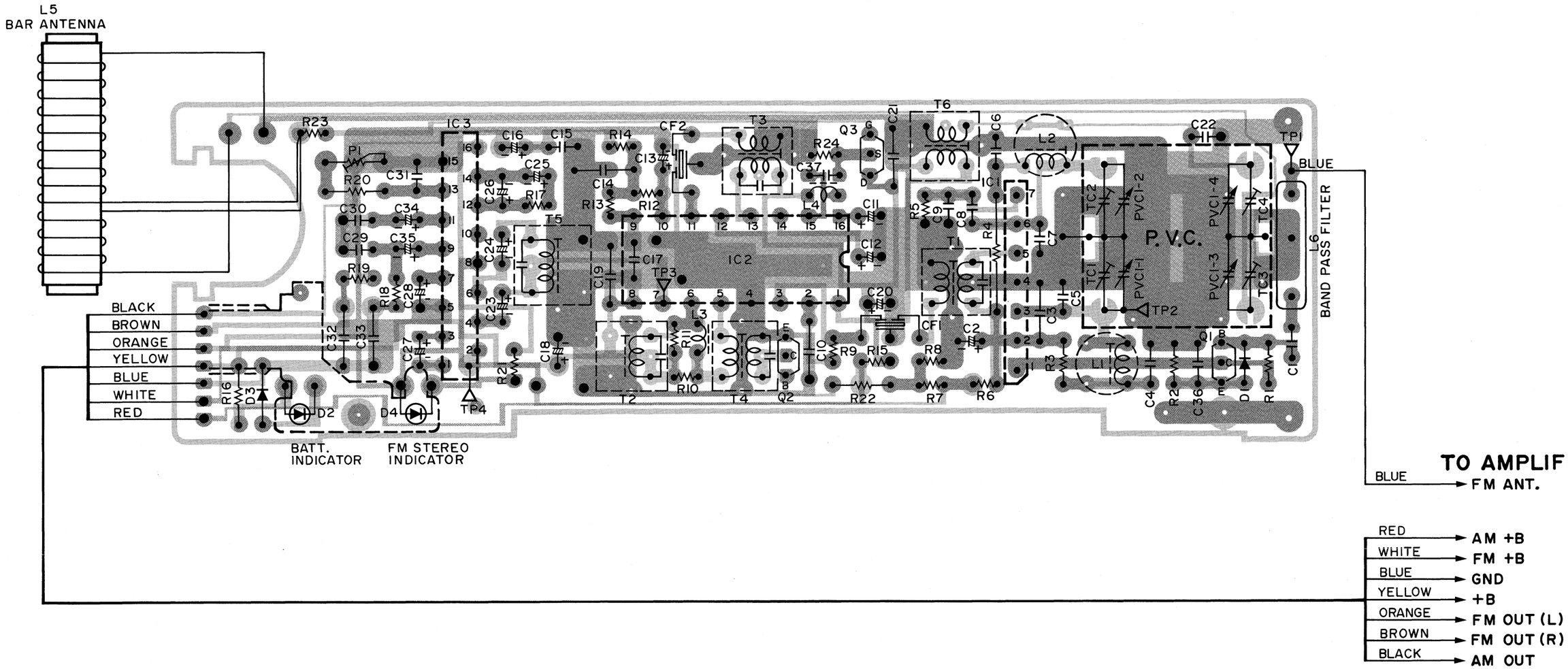
μPC 1222C BLOCK DIAGRAM



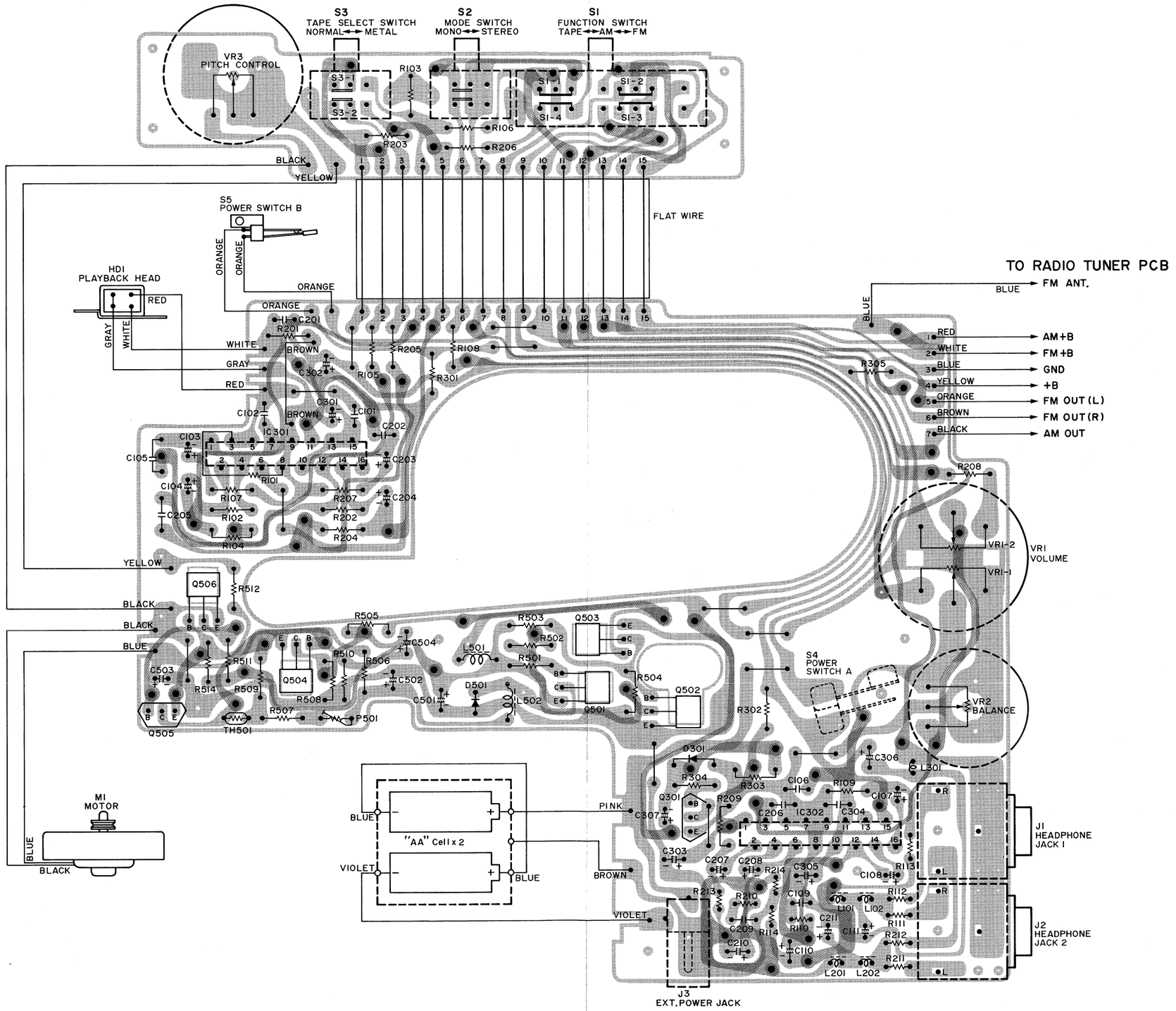
BA 1360 BLOCK DIAGRAM



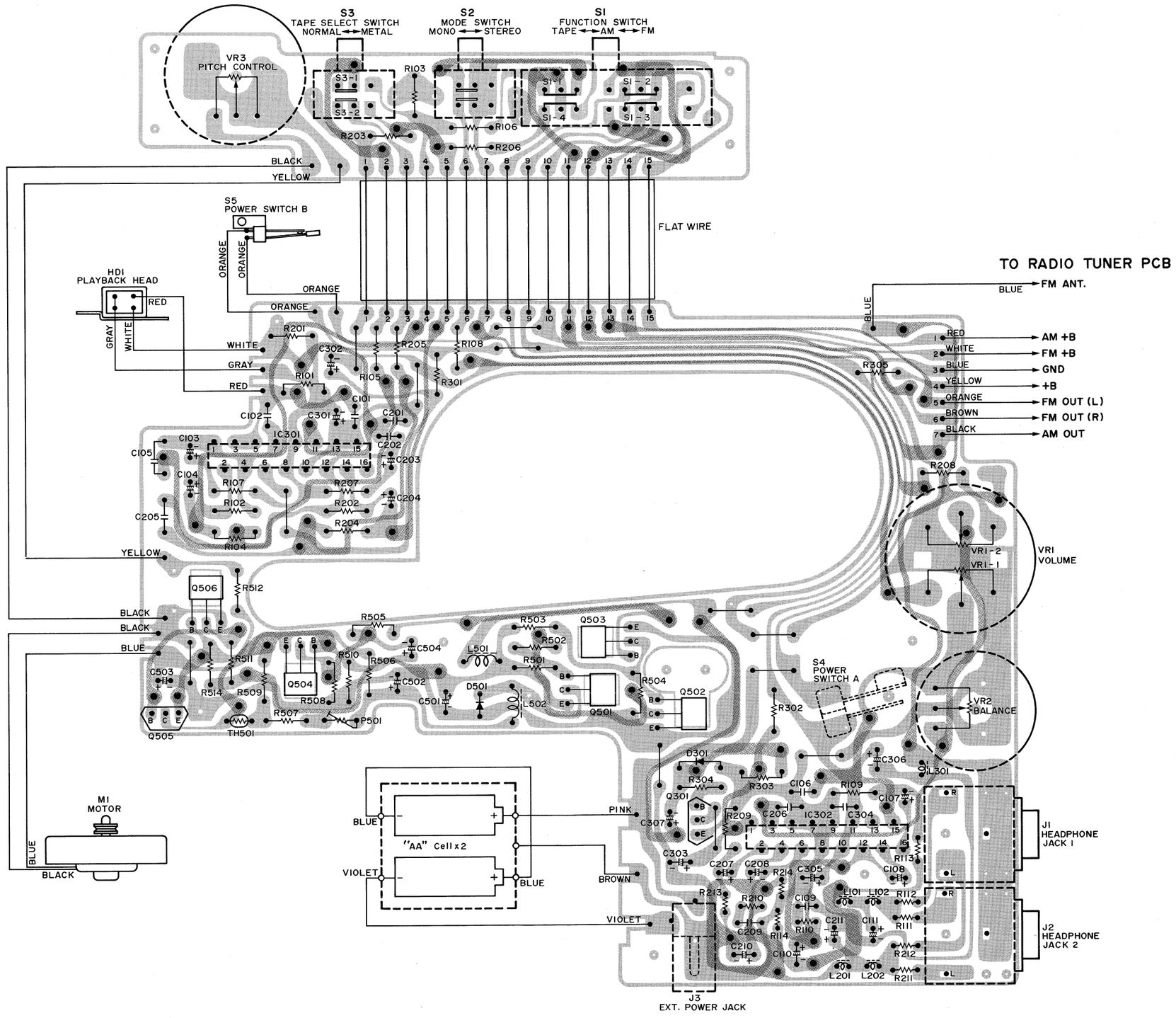
RADIO TUNER P.C.BOARD



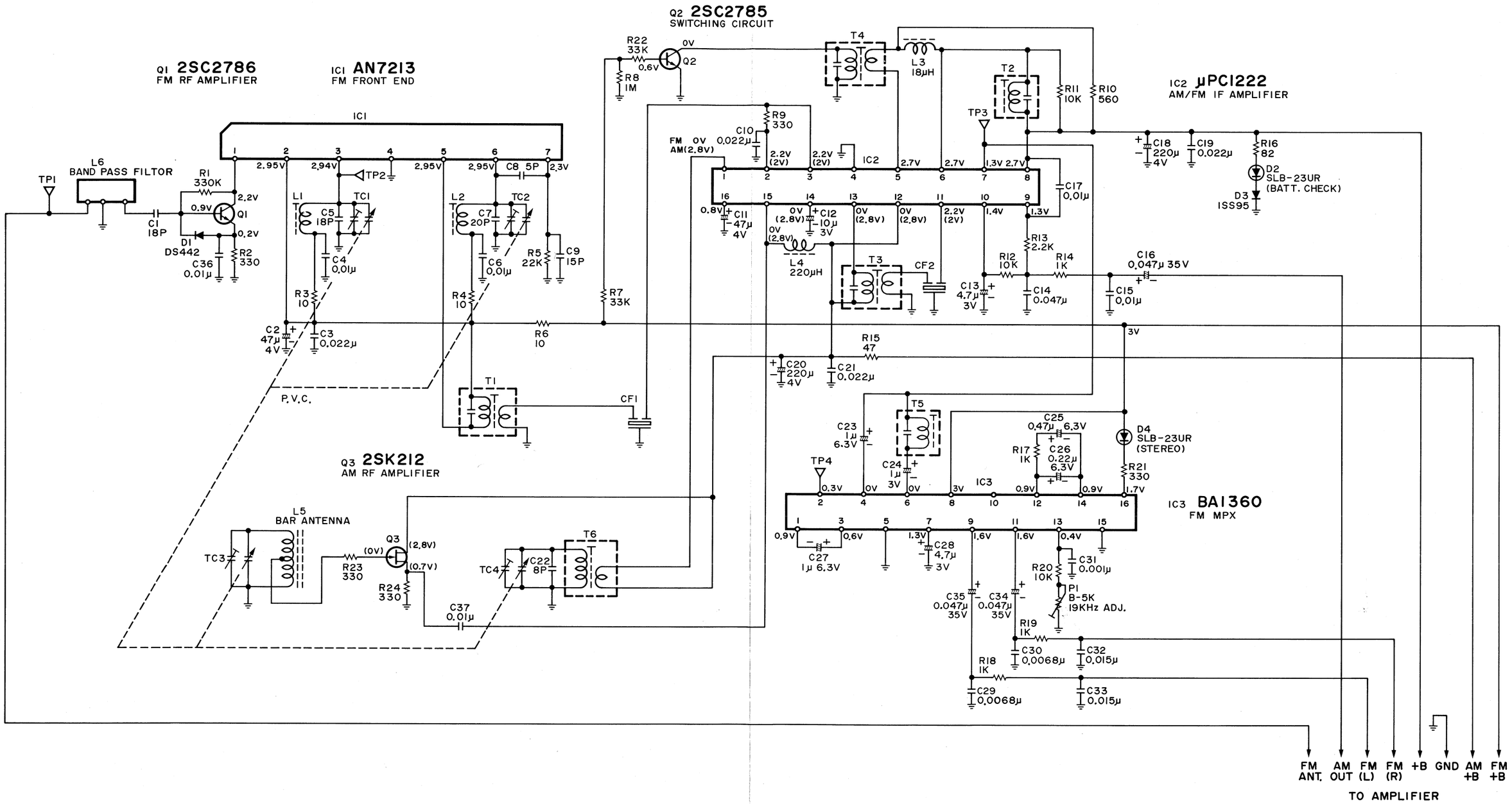
AMPLIFIER P.C.BOARD (Before Alteration)



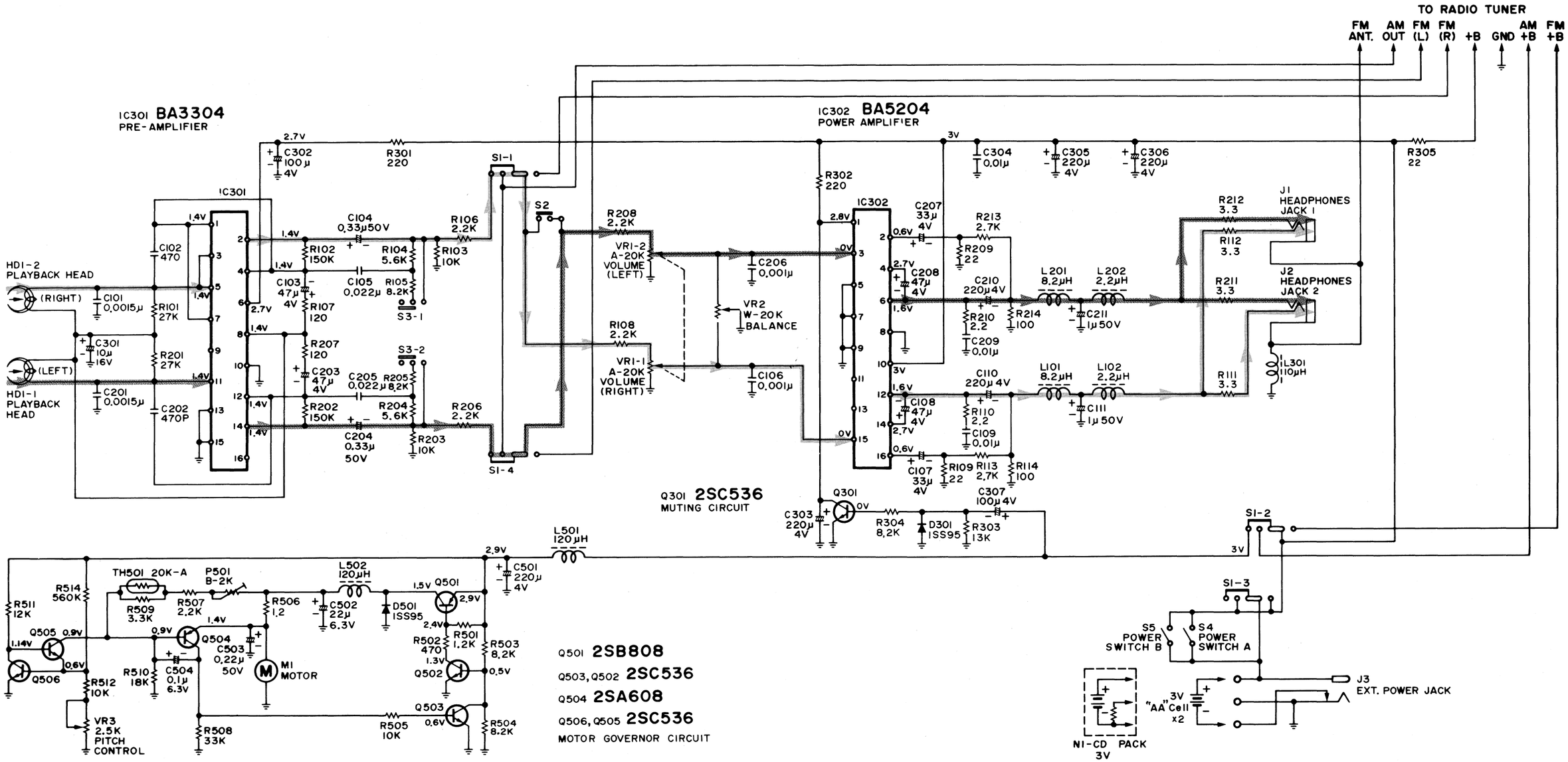
AMPLIFIER P.C.BOARD (After Alteration)



SCHEMATIC DIAGRAM (Tuner)



SCHEMATIC DIAGRAM (Amplifier)



No.	Name	Position
S1	Function Switch	TAPE
S2	Mode Switch	MONO
S3	Tape Select Switch	NORMAL
S4	Power Switch A	OFF
S5	Power Switch B	OFF